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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/768,617	01/25/2001	Bret S. Clark	3174-000001/CPA	5733

7590 11/06/2002
Harness, Dickey & Pierce, P.L.C.
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Bloomfield Hills, MI 48303

EXAMINER

SMITH, TYRONE W

ART UNIT	PAPER NUMBER
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2837

DATE MAILED: 11/06/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/768,617

Applicant(s)

CLARK ET AL.

Examiner

Tyrone W Smith

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 October 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☒ Interview Summary (PTO-413) Paper No(s). 11.
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____. 6) ☐ Other: _____.

DETAILED ACTION

1. Finality of office action is eliminated based on response and arguments presented by the Applicant. Examiner is reopening prosecution and submitting a new Non-Final office action.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-16 rejected under 35 U.S.C. 103(a) as being unpatentable over Murty (4544868) in view of Heinkel (EP 1,071,200 A2). Murty discloses a three-phase brushless DC motor controller, which includes a source of a direct voltage (Figure 1 #16), an inverter (Figure 1 #18) having a switching circuit for regulating the DC bus current to a fixed level. Figures 4(A-C) and 5(A-C) shows the fix level (I_{ref}). However, Murty does not disclose using the switching circuit for forcing consecutive phases of the motor to share the current at commutation. For example, enabling the transistors such that each phase of the motor has a phase turn on point that occurs before a phase turn off point of the preceding phase. Heinkel discloses a electronically commutatable motor which includes a source for direct voltage (Figure 1 item U_{batt}) and control module (Figure 2 STE-PWM). The control module drives the output stages in overlapping control phases using PWM control signal or current (see Figure 4). The method used by Heinkel relates to the present invention where each phase of the motor has a phase

turn on point that occurs before a phase turn off point of the preceding phase (column 3 lines 24 – 67 and column 4 lines 1-7). It would have been obvious to one of ordinary skill in the art at the time of invention to combine Murty's invention of a three-phase brushless DC motor controller with Heinkel's invention of a electronically commutatable motor. The advantage of combining the two would provide a system without the use of a position sensor to assure, during start-up, a desired rotational direction without problems or issues.

Regarding Claims 2-6. Murty discloses shows that the winding energization is controlled by a read only memory (ROM) or programmable logic array (PLA) (Figure 1 #44) which directs the driver circuit (Figure 1 #46) connected to the data lines to supply drive current to the various bridge transistors (column 2 lines 57-68 and column 3 lines 1-7).

Regarding Claims 5, 6, 10, 15 and 16. Murty discloses a shunt resistor (Figure 1 #96) connected in series between the battery and the inverter and the line connects the inverter side of the shunt resistor as an input to the PWM circuit. People skill in the art understand that the shunt resistor or device connected in parallel across other devices or apparatus and diverting some of the current from it. Appreciable voltage exists across the shunted device or apparatus and an appreciable current may exist in it.

Regarding Claims 13 and 14. Refer to the previous rejection regarding DC bus current regulated at a fixed level.

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tyrone W Smith whose telephone number is 703-306-5987. The examiner can normally be reached on weekdays from 8:30am to 5:00pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Nappi, can be reached on (703) 308-3370. The fax phone number for the organization where this application or proceeding is assigned is 703-308-3431.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1782.

Tyrone Smith

Art Unit 2837


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